What is claimed is:

1. A magnetic fluid bearing motor provided with a bearing assembly, the bearing assembly comprising: a shaft formed partly or wholly of a ferromagnetic substance; a substantially solid porous sleeve faced to the shaft with a bearing portion with a minimum gap provided therebetween; magnetic fluid oil impregnated into the gap and the porous sleeve; and,

wherein a ferromagnetic substance included in the shaft is locally magnetized so as to create magnetic flux density gradient that is set at a maximum on the bearing surface of the porous sleeve and decreases gradually as it stays away therefrom.

2. The magnetic fluid bearing motor as claimed in claim 1, wherein a boundary of a magnetization-varying portion of the shaft is aligned with a line of a flow of the magnetic fluid oil occurring with rotary motion of the sleeve or the shaft.

3. The magnetic fluid bearing motor as claimed in claim 2, wherein the bearing portion has a groove for generating dynamic pressure formed on a surface of the shaft or the sleeve, and a magnetization-varying portion is arranged in a position of the shaft that corresponds to the groove.

4. The magnetic fluid bearing motor as claimed in claim 3, wherein the groove is realized as a herringbone groove, and the magnetization-varying portion of the shaft is arranged in a vicinity of both ends of the herringbone groove.

5. The magnetic fluid bearing motor as claimed in claim

3, wherein the groove is realized as a spiral groove, and the magnetization-varying portion of the shaft is arranged in a vicinity of an oil admission end of the spiral groove.

6. A magnetic fluid bearing motor provided with a bearing assembly, the bearing assembly comprising: a substantially solid porous sleeve including a ferromagnetic material; a shaft faced to the sleeve with a bearing portion with a minimum gap provided therebetween; magnetic fluid oil impregnated into the gap and the porous sleeve; and the like,

wherein a surface of the bearing portion of the sleeve is locally magnetized so as to create magnetic flux density gradient that is set at a maximum on the bearing surface of the porous sleeve and decreases gradually as it stays away therefrom.

7. The magnetic fluid bearing motor as claimed in claim 6, wherein a boundary of a magnetization-varying portion remaining on the surface of the bearing portion of the sleeve is aligned with a line of a flow of the magnetic fluid oil that occurs with rotary motion of the sleeve or the shaft.

8. The magnetic fluid bearing motor as claimed in claim 7, wherein the bearing portion has a groove for generating dynamic pressure formed on the surface of the shaft or the sleeve, and a magnetization-varying portion is arranged in a position of the surface of the bearing portion of the sleeve that corresponds to the groove.

9. The magnetic fluid bearing motor as claimed in claim

8, wherein the groove is realized as a herringbone groove, and the magnetization-varying portion of the surface of the bearing portion of the sleeve is arranged in a vicinity of both ends of the herringbone groove.

10. The magnetic fluid bearing motor as claimed in claim 8, wherein the groove is realized as a spiral groove, and the magnetization-varying portion of the surface of the bearing portion of the sleeve is arranged in a vicinity of an oil admission end of the spiral groove.